REMARKS/ARGUMENTS

Prior to this Amendment, claims 1-21 were pending in the Application.

Independent claim 10 is amended to include the limitations of claim 11, which is cancelled, and also to clarify that the reciprocating mass does not contact the specimen surface (e.g., not a contact based vibratory device or driver).

Independent claim 12 is also amended similar to claim 10 to clarify that the reciprocating mass remains spaced apart from the specimen as it travels on its linear displacement path.

After entry of the Amendment, claim 1-10 and 12-21 remain for consideration by the Examiner.

Allowable Subject Matter

In the January 28, 2010, Office Action, the Examiner objected to claims 2-4, 5, 7, 8, 13-16, and 18-20 as being dependent upon a rejected base claim, but the Examiner found these claims to be allowable if rewritten in independent form.

Applicants appreciate the Examiner finding these claims allowable over the cited references, but, in this Amendment, the claims are not rewritten in independent form because Applicants believe the base independent claims for these allowable claims are also in condition for allowance over the cited reference (i.e., the cited references fail to teach or suggest at least one limitation of each independent claim pending in the application).

Claim Rejections under 35 U.S.C. §102

The Office Action rejected claims 1, 5, 9, 12, 17, and 21 under 35 U.S.C. §102(e) as being anticipated by U.S. Pat. Appl. Publ. No. 2002/0038987 ("Magnussen"). This rejection is respectfully traversed based on the following remarks.

A *prima facie* case of anticipation requires that a single reference teach, either expressly or inherently, each and every element or limitation of the claim, including any functional limitations. M.P.E.P. § 2131. Because Magnussen does not teach or suggest each element recited in the pending claims, Magnussen does not anticipate any of the pending claims.

Initially, independent claim 17 is believed allowable over Magnussen because claim 17 differs from claim 1 in that it includes both a linear actuator (as called out in claim 1) and a "transverse load actuator." The Office Action rejects claim 17 for the same reasons as provided for rejecting claim 1, but this is improper due to the "transverse load actuator" limitation not found in claim 1 (i.e., the Examiner has not provided a citation for each and every limitation in the 102 reference).

Further, claim 17 includes limitations similar to those found in claim 7, which depends from claim 1. The Office Action found claim 7 to contain subject matter allowable over Magnussen (if rewritten in independent form). Because claim 17 includes limitations similar to those found in claim 1 as modified by claim 7 (i.e., rewriting claim 7 in independent form to include all intervening claims), claim 17 is believed allowable over Magnussen for the reasons for allowing claim 7 over this reference. Claim 21 depends from claim 17 and is believed allowable over Magnussen at least for the reasons provided for allowing claim 17 over this reference.

Before turning to claim 1, it may be useful to explain why the amendments to independent claim 12 (and claim 10) further distinguish the claimed method from the method/device shown by Magnussen. Claim 12 as amended calls for a flap load to be applied to a specimen with a linear displaced mass "wherein the mass remains spaced apart from the specimen during reciprocating along the linear displacement path" (emphasis added). In Figures 3-6 and elsewhere, Magnussen shows a vibration element 26 that contacts the driven element 42. Also, the vibration element 26 is described as having a "contacting portion 44" in para. [0143]. Hence, Magnussen does not show the step of reciprocating a mass where the mass remains spaced apart from the specimen. For this reason alone, claim 12 is not anticipated by Magnussen. Additional reasons for allowing claim 12 over this reference are provided below.

Referring now to claim 1, this claim is directed toward an apparatus for applying a cyclical load to a specimen that "comprises a wind turbine blade that is rigidly mounted at a root end and unsupported at a tip end." Magnussen fails to teach an apparatus for mounting a test specimen in this manner, and, hence, Magnussen cannot anticipate claim 1 for this reason alone. Further, claim 1 calls for an actuator that provides linear displacement of a mass along a linear displacement path that is

perpendicular to the longitudinal axis. Magnussen fails to show a mass that is moved perpendicular to the specimen but, instead, teaches a vibration element (element 26) contacting the specimen (driven element 26) and moving in an elliptical pattern (patterns 100a, 100b). Claim 1 further calls for displacement of the tip (which is unsupported) relative to the longitudinal axis of the specimen, whereas Magnussen shows the driven element 42 supported at both ends (by elements or sidewalls 80 that support the element 42 for rotation). For all of these reasons, Magnussen fails to anticipate the apparatus of claim 1, and each of these differences is discussed further in the following remarks.

First, the Office Action cites Magnussen as teaching all of the limitations of claim 1, and it may be useful initially to discuss more generally what teaching is provided by Magnussen. Generally, Magnussen refers to the excitation of material samples using piezoelectric elements placed in contact with the driven element. The term "driven element" is used because Magnussen is directed to a vibratory motor (see the Magnussen title). To this end as discussed in para. [0015], Magnussen discloses that a vibration element may combine a piezoelectric element and resonator to cause "an elliptical motion in a first direction at a predetermined point on the motor that is going to be used to drive a driven object." Such a motor is shown in Figure 5 where the vibration element 26 contacts at 44 the rod/driven element 42 to cause it to rotate about its axis 45 on end bearing surfaces/sidewalls 80 (see para. [0150] which discusses the fact that the element 42 rotates in response to elliptical motions 100a, 100b). Clearly, this is a very different device than used to apply flap loads to a wind turbine blade, as called out in Applicants' claims.

Now, turning again to the specific claim language, claim 1 calls for the specimen (wind turbine blade) to be "rigidly mounted" at a root end and unsupported at a tip end. Magnussen teaches away from such a mounting arrangement for its specimen or driven element 42. For example, in Figure 5, Magnussen teaches a motor where the driven element 42 may act as a drive shaft rotating about axis 45. Hence, it cannot be rigidly mounted at one end but is instead pivotally supported at one end by sidewall 80. Also, it is not "upsupported" at its tip end as a second sidewall/bearing 80 is provided at the

"tip" or second end. For at least these reasons, claim 1 is not anticipated by the teaching of Magnussen.

Further, claim 1 calls for an actuator that moves a mass along a linear displacement path that is perpendicular to the longitudinal axis of the specimen so as to apply a bending/flap load to the specimen. In contrast, Magnussen shows, again in Figure 5, a vibration element 26 using piezoelectric devices and using a contact portion 44 that moves in elliptical paths 100a, 100b (NOT linear paths) to rotate the rod 42. There is no showing of a reciprocated mass nor that such a mass is moved along a linear path that is perpendicular to the longitudinal axis 45. Hence, there is no teaching in Magnussen of the actuator as called for in claim 1, and claim 1 is not anticipated by this reference for this additional reason.

Claims 5 and 9 depend from claim 1 and are believed allowable over Magnussen at least for the reasons provided for allowing claim 1 over this reference.

Independent claim 10 is directed to a system for vibrating a test specimen such as a turbine blade. The system includes a reciprocating mass means that operates to sinusoidally vibrate the specimen along its longitudinal axis at about a resonance frequency. As with claim 1, in the system, the specimen is supported rigidly at a first end but is unsupported at a distal second end. As discussed with reference to claim 1, Magnussen shows pivotal support at both ends of an elongated driven element 42. Hence, Magnussen fails to show supporting a test specimen as called for in claim 10. The reciprocating mass means is mounted to the specimen between the first and second ends. A control means is provided that operates the reciprocating mass means such that a vibration displacement of the specimen is varied and such that the mass does not contact the specimen. Hence, the reasons provided above for allowing claim 12 are applicable to claim 10, and claim 10 is believed allowable over Magnussen for this additional reason.

Independent claim 12 is directed toward a method for vibrating a wind turbine blade specimen. The method includes mounting a mass nearer to the tip than to the root of the blade, and the mounting is performed such that the mass can be reciprocated along a linear displacement path that is perpendicular to the blade axis such that a flap load is applied. The method also calls for reciprocating the mass at

about the resonance frequency of the blade/specimen such that the mass does not contact the specimen. As discussed above with reference to claims 1 and 10, Magnussen fails to show a number of the limitations of claim 12 (such as a mass being reciprocated along a linear displacement path or the mass being spaced apart from the specimen such that the portion that is vibrating is not contacting the specimen as shown by Magnussen), and Applicant requests that the rejection be reconsidered and withdrawn.

Further, the Office Action rejected claims 10 and 11 under 35 U.S.C. §102(e) as being anticipated by U.S. Pat. No. 6,601,456 ("Davidson"). Claim 11 is cancelled, but the rejection of claim 10 is respectfully traversed based on the following remarks.

Independent claim 10 is directed to a system for vibrating a test specimen such as a turbine blade. The system includes a reciprocating mass means that operates to sinusoidally vibrate the specimen along its longitudinal axis at about a resonance frequency. In the system, the specimen is supported rigidly at a first end but is unsupported at a distal second end, and the reciprocating mass means is mounted to the specimen between the first and second ends. A control means is provided that operates the reciprocating mass means such that a vibration displacement of the specimen is varied and the mass does not contact the specimen. Davidson fails to show either element of claim 10, and Applicant requests that the anticipation rejection of claim 10 be withdrawn.

First, the specimen is only supported at a first end and is unsupported at a second end, which facilitates the sinusoidal vibration at the specimen's resonance frequency. Davidson, as shown in Figures 1-3, shows the specimen 21 being rigidly mounted at each end. Hence, the test machine 10 of Davidson teaches a different device and does not anticipate claim 10.

Second, in claim 10, the reciprocating mass means is mounted between the first and second ends of the specimen and is adapted to provide sinusoidal vibration of the specimen along its longitudinal axis. The Office Action cites Davidson as showing this feature, but Davidson shows, instead, that its fretting structure 20 has no actuators but is instead clamped to the specimen 21 via rods 22 to provide static loads (to create fretting on the specimen surface). The dynamic loading in the machine 10 is provided

by actuators 16, which are mounted to the ends of the specimen, and there is no teaching of sinusoidally vibrating the specimen 21 along axis B-B (e.g., Applicant requests that a specific citation in Davidson be provided for the sinusoidal vibration or the rejection be withdrawn as not supported by the reference).

Third, in claim 10, the reciprocating mass does not contact the specimen whereas the fretting piece 24 is shown in Davidson's figures as contacting the specimen 21. For this additional reason, Davidson fails to anticipate the system of claim 10.

In summary, neither Magnussen nor Davidson discloses each and every element recited in claims 1-10 and 12-21, and thus neither reference anticipates the pending claims. Accordingly, Applicants respectfully request that all claim rejections under 35 U.S.C. §102(e) be withdrawn.

Conclusions

In view of the foregoing amendments and arguments, Applicants respectfully request the timely allowance of all pending claims. If the Examiner has any questions regarding this application, the Examiner is invited to contact the undersigned at 303-384-7551.

In the event that any fees are due in connection with this response, please debit Deposit Account No. 14-0460.

Respectfully submitted,

Dated: April 26, 2010

By: _____

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